MID TERM SEMESTER EXAMINATION, MARCH-2018

COURSE: M.Tech (2nd Semester)
Course No: PGMTH2F004T
Course Title: Database Application Development
Time Allowed: 1.5 Hours **Max Marks:** 25

SECTION-A

Section A contains five multiple choice questions. All are compulsory carrying one mark each.

Q1. Choose the right options for each of the following multiple-choice questions

I. In an ER model, ... is described in the database by storing its data.
A. entity
B. attribute
C. relationship
D. notation
II. A ..... is used to define overall design of the database
A. schema
B. application program
C. data definition language
D. code.
III. Data independence means
A. data is defined separately and not included in programs.
B. programs are not dependent on the physical attributes of data
C. programs are not dependent on the logical attributes of data
D. both B and C
IV. The entity set person is classified as student and employee. This process is called

A. generalization
B. specialization
C. inheritance
D. constraint generalization.
V. Which-one of the following statements about normal forms is FALSE?
A. BCNF is stricter than 3 NF
B. lossless, dependency -preserving decomposition into 3 NF is always possible
C. loss less, dependency – preserving decomposition into BCNF is always possible
D. any relation with two attributes is BCNF

SECTION- B

Section B contains four short answer questions of 3 Marks each. Any two need to be attempted.

Q2. Explain the difference between physical and logical data independence.

Q3. Explain the distinction between condition-defined and user-defined constraints. Which of these constraints can the system check automatically? Explain your answer.

Q4. Explain the distinction between disjoint and overlapping constraints.

Q5 Define the concept of aggregation. Give two examples of where this concept is useful.

SECTION –C

Section C contains two long answer questions with internal choice. Each question carries 7 Marks

UNIT-I

Q6. Given the following descriptions, create an appropriate ER diagram for each of the specified relationships.

(a) Each company operates four departments, and each department belongs to one company.

(b) Each department in part (a) employs one or more employees, and each employee is employed by one department.

(c) Each of the employees in part (b) may or may not have one or more dependents, and each dependent belongs to one employee.

(d) Each employee in part (c) may or may not have an employment history

OR

The IT Training Group has contacted you to create a conceptual model by using the Entity–Relationship data model for a database that will meet the information needs for its training program. The Company Director gives you the following description of the training group's operating environment.

The Company has twelve instructors and can handle up to one hundred trainees per training session. The Company offers five advanced technology courses, each of which is taught by a teaching team of two or more instructors. Each instructor is assigned to a maximum of two teaching teams or may be assigned to do research. Each trainee undertakes one advanced technology course per training session.

Given this information, draw an ER diagram for IT Training Group.

UNIT-II

Q7. Consider the universal relation R = {A, B, C, D, E, F, G, H, I} and the set of functional dependencies F = {{A, B} -> {C}, {A} -> {D, E}, {B} -> {F}, {F} ->{G, H}, {D} -> {I, J} }. What is the key for R? Decompose R into 2NF, then 3NF relations.?

OR

Consider the universal relation R = {A, B, C, D, E, F, G, H, I} and the set of functional dependencies G = { {A, B} -> {C}, {B, D} -> {E, F}, {A, D} -> {G, H}, {A} -> {I}, {H} -> {J} }. What is the key for R? Decompose R into 2NF, then 3NF relations.?